Evaluation of rapid microchemical methods for NPK analysis in soil

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Rapid microchemical methods have been used by many scientists throughout the world to determine nutrient contents in soil. The advantage of these methods over conventional methods is that they are rapid, simple and require only minute quantities of chemicals, which make them cost effective. Unlike conventional methods, the microchemical methods do not involve laborious analytical procedures as they require only a single extraction, and are hence well suited for soil testing in the field.

Soil is a complex material, and soil extracts usually contain diverse types of ions, which could interfere in the different analyses carried out on the extract. The method will therefore be more suitable for soils in which such interferences are at a minimum. This study was conducted to determine the applicability of the rapid methods in the determination of NPK contents of Sri Lankan soils and to give quick remedial measures to overcome any deficiency problems.

Soils belonging to three types (RYP, RBL, and RYL) were used to test the reliability and accuracy of the rapid microchemical methods to determine available N (NH_4-N &NO_3-N), P and K contents. Using Morgan's Universal extracting solution, (sodium acetate-acetic acid solution, pH=4.8). The accuracy of each test was verified by correlating the results obtained with those of conventional methods. Results showed that there was significant correlation between the two methods for NO_3-N (r^2 = 0.85), NH_4-N (r^2 = 0.75), available P (r^2 = 0.89) and available K (r^2 = 0.98). Thus indicating that these simple methods are accurate enough, and can be used for making fertilizer recommendations in the field.

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